What is claimed is:

1. A process for preparing polyisobutene having a number-average molecular weight of from 400 to 50 000 and a content of methylidene groups of more than 50 mol%, in which
   a) isobutene is polymerized in the presence of a catalyst which comprises a halogenated Lewis acid,
   b) the catalyst is removed and/or deactivated, and
   c) the resulting polyisobutene is contacted with a zeolite of an average pore size of from 5 to 15 Å.

2. The process according to claim 1, in which the isobutene is polymerized in the presence of a diluent to obtain a solution of the polyisobutene in the diluent, and the solution of the polyisobutene is contacted with the zeolite.

3. The process according to claim 1 or 2, in which the polyisobutene or the solution of the polyisobutene is also contacted with an acid scavenger which is selected from bases, nitrile compounds and immobilized bases.

4. The process according to claim 3, in which the base is selected from ammonia and organic amines.

5. The process according to claim 3, in which the nitrile compound is selected from acetonitrile, propionitrile and benzonitrile.

6. The process according to claim 3, in which the immobilized base is selected from alumina and alumina which is doped with hydroxides, oxides, carbonates, hydrogencarbonates and/or cyanides.

7. The process according to any of the preceding claims, in which the water content of the polyisobutene or of the solution of the polyisobutene is reduced to less than 10 ppm before the zeolite treatment.

8. The process according to claim 7, in which the water content is reduced by contacting the polyisobutene or the solution of the polyisobutene with a zeolite of an average pore size of 4 Å or less.

9. The process according to any of claims 2 to 7, in which the Lewis acid is boron trifluoride.

10. The process according to any of claims 2 to 9, in which the diluent comprises C_4 hydrocarbons other than isobutene.

11. The process according to any of claims 3 to 9, in which the isobutene is polymerized in the presence of a diluent to obtain a solution of the polyisobutene in the diluent and, before the contacting with the zeolite, the diluent is removed fully or partly or replaced by isobutene oligomers.